

RESUME

7/02

Paul J. Price, Ph.D.

Research Fellow, GIBCO Cell Culture R&D

PUBLICATIONS: ORIGINAL ARTICLES

PRICE, P., EVEGE, E., NESTLER, L., GREFRATH, P., NAUMOVIC, B., FATUNMBI, F., JAYME, D.: A versatile serum-free medium for kidney epithelial cell growth and virus production. *Focus* 24: 24-28, 2002

BLOOM, F., PRICE, P., LAO, G., XIA, J.L., CROWE, J.H., BATTISTA, J.R., HELM, R.F., SLAUGHTER, S., POTTS, M.: Engineering mammalian cells for solid-state sensor applications. *Biosensors and Bioelectronics*, 16: 603-608, 2001.

OHKIE, E.C., TILKINS, M.L., CICCARONE, V.C., PRICE, P. J.: Improving the transfection efficiency of post-mitotic neurons. *J. Neuroscience Methods* 2001. 112 (2), 95-99.

PRICE, P.J. AND BREWER, G.J.: Serum-free media for neural cell culture. In *Protocols for Neural Cell Culture*, 3rd Ed. Chapter 19, Ed. S. Federoff and A. Richardson, Human Press, 2001, pp. 255-264.

PRICE, P.: BVD virus detection and risk minimization in FBS production. In *Pestivirus contamination of bovine sera and other bovine virus contamination* (2001) edqm Proceedings, 87-88.

JAYME, D.W., PRICE, P.J., PLAVSIC, M.Z., EPSTEIN, D.A.: Low serum and serum-free cultivation of mammalian cells used for virus production application. In *Animal Cell Technology: Products from Cells, Cells as Products* (1999) Kluwer (Dordrecht), pp. 459-461.

GOLDSBOROUGH, M.D., TILKINS, M.L., PRICE, P.J., LOBO-ALFONSO, J., MORRISON, J.R., MENESS, J., PENDERSEN, R., KOLLER, B., LATOUR, A.: Serum-Free Culture of murine Embryonic Stem (ES) Cells. *Focus* 20 (1): 8-12, 1998.

PRICE, PJ, SAMROCK, RL, LOBO-ALFONSO, JO AND GREEN, CE: Retention of xenobiotic-inducible cytochrome P450 gene expression in hepatocytes. *In Vitro Toxicology* 10 (3): 365-371, 1997.

PRICE, PJ AND EVEGE, EK: Serum-free medium without animal components for virus production. *Focus* 19: 67-69, 1997.

BREWER GJ AND PRICE PJ: Viable cultured neurons in ambient carbon dioxide and hibernation storage for a month. *NeuroReport* 9: 1509-1512, 1996.

PRICE PJ, GRUBER DF AND SMITH, SR: Substituting Pyridoxine for Pyridoxal in the formulation of DMEM. *Focus* 17: 75-76, 1995.

LOBO-ALFONSO J, SAMROCK R AND PRICE, PJ: Isolation and culture of Hepatocytes. *Focus* 17:6-9, 1995.

BREWER GJ, TORRICELLI JR, EVEGE EK, AND PRICE PJ: Neurobasal/B27: A new serum-free medium combination optimized for survival of hippocampal neurons also supports other neurons of the CNS. *Focus* 16:6-9, 1994.

JAYME DW, KUBIAK JM AND PRICE PJ: Continuous automated reconstitution of liquid media concentrates. In: *Animal Cell Technology, Basic and Applied Aspects*, Vol. 6, 1994.

JAYME DW, FIKE RM, KUBIAK JM AND PRICE PJ: Improved bioreactor productivity and manufacturing efficiency using liquid media concentrates. European Soc. for Animal Cell Technology, May 1993.

JAYME DW, FIKE RM, KUBIAK JM, NASH CR AND PRICE PJ: Use of liquid media concentrates to enhance biological productivity. In: Animal Cell Technology, Basic and Applied Aspects, Vol. 5, Proceedings of the 5th International Meeting of the Japanese Assoc. for Animal Cell Technology, Omiya, Japan, eds. S. Kaminogawa, A. Ametani and S. Hachimura, Kluwer: pgs. 215-222, 1993.

BREWER GJ, TORRICELLI JR, EVEGE EE, AND PRICE PJ: Growth of neurons from dentate gyrus, septum, striatum, substantia nigra, cerebral cortex or cerebellum in B27, a new serum-free supplement. *J. Neuroscience Res.* 35:567-576, 1993.

FIKE R, KUBIAK J, PRICE P AND JAYME D: Feeding strategies for enhanced hybridoma productivity: automated concentrate supplementation. *Biopharm* 6:49-54, 1993.

LOBO JO, SAMROCK RL, JAYME DW AND PRICE, PJ: Sustained inducibility of cytochrome P450 activity in rat hepatocytes cultured in a serum-free medium. In Animal Cell Technology: Basic and Applied Aspects. Proceedings of the 5th Annual Meeting of the Japanese Assoc. for Animal Cell Technology, Omiya, Japan, 1992, eds. S. Kaminogawa, A. Ametani and S. Hachimura, Kluwer , pgs. 195-201, 1993.

JAYME DW, DALEY JP AND PRICE PJ: Serum-free media for the growth and maintenance of differentiated state of keratinocytes, hepatocytes and neural cells. In: Animal Cell Technology: Basic and Applied Aspects, Vol. 4, eds. Murakami, Shirahata and Tachibana. Kluwer Acad. Publishers, pp 327-334, 1992.

PRICE PJ: Chromosome abnormalities in amniotic fluid cells in culture. *Karyogram* 14: 10-11, 1988.

MARCOVINA S, CREMONESI L, PRICE PJ, AND MCDOUGAL JS: Production and immunochemical study of monoclonal antibodies directed against human low density lipoprotein. *Dev. Biolog. Standardization* 57: 399-408, 1984.

WELLS DE, AND PRICE PJ: Simple rapid methods for freezing hybridomas in 96-well microculture plates. *J. Immunol. Methods* 59:49-52, 1983.

PRICE PJ AND GREGORY EA: Relationship between *in vitro* growth promotion and biophysical properties of the serum supplement. *In Vitro* 18 (6):576-584, 1982.

PRICE PJ, SKEEN PC, AND HASSETT CM: 9-B-D-Arabinofuranosyladenine inhibition of chemically induced rat embryo cell transformation; *Proc. Soc. Exp. Biol. Med.* 159:253-255, 1979.

PRICE PJ, GREGORY EA, AND SKEEN PC: Ritalin, Benzedrine and Dexedrine do not transform F1706 rat cells; *Cancer Letters* 5: 345-349, 1979.

CURREN RD, HOMER CJ, PRICE PJ, AND FREEMAN AE: Mutagenesis of human cells by 3-methylcholanthrene; *Mutation Res.* 60 (1):109-113, 1979.

PRICE PJ, MANSFIELD JI, AND HASSETT CM: Rimantadine but not amantadine protect Fischer rat embryo cells from transformation induced by 3-methylcholanthrene and Benzo(a) Pyrene. *In Vitro* 15 (2):82-85, 1979.

PRICE PJ, HASSETT CM, AND MANSFIELD JI: Transforming potential of trichloroethylene and proposed industrial alternatives. *In Vitro* 14:290-293, 1978.

PRICE PJ, SUK WA, FREEMAN AE, LANE WT, PETERS RL, SASS B, VERNON ML, AND HUEBNER RJ: *In Vitro* and *in vivo* indications of the carcinogenicity and toxicity of food dyes. *Int. J. Cancer.* 21:361-367, 1978.

PREMKUMAR-REDDY E, PRICE PJ, HEILMAN CJ, AND SARMA PS: Spontaneous expression of endogenous type C RNA viruses by BABL/c splenic B-lymphocytes on continuous cultures. *Virol.* 84:341-347, 1978.

PRICE PJ, SUK WA, PETERS RL, GILDEN RV, AND HUEBNER RJ: Chemical transformation of rat cells infected with xenotropic type-C RNA virus and its suppression by virus-specific antiserum. *Proc. Natl. Acad. Sci.* 74:579-581, 1977.

PRICE PJ, SUK WA, SKEEN PC, SPAHN GJ, AND CHIRIGOS MA: Geldanamycin inhibition of methylcholanthrene-induced rat embryo cell transformation. *Proc. Soc. Expt. Biol. and Med.* 155:461-463, 1977.

PREMKUMAR-REDDY E, PRICE PJ, CHUNG K-C: Continuous culturing of murine splenic B-lymphocytes: Synthesis and surface deposition of IgM and putative IgD molecules. *Cell* 8:397-402, 1976.

PRICE PJ, BELLEW TM, KING MP, FREEMAN AE, GILDEN RV, AND HUEBNER RJ: Prevention of viral-chemical co-carcinogenesis in vitro by type-specific anti-viral antibody. *Proc. Nat. Acad. Sci.* 73:152-155, 1976.

VERNON ML AND PRICE PJ: Brief communication: The findings of virus-like particles in geometric tubuloreticular structures (GTRS). *J. Nat. Cancer Inst.* 56:855-857, 1976.

PRICE PJ, AULETTA AE, KING MP, HUGUNIN PM, AND HUEBNER RJ: The co-carcinogenic activity of 4-nitropyridine-1-oxide (4NPO) and prevention of transformation by type-specific anti-viral antibodies. *In Vitro* 12: 595-598, 1976.

MISHRA NK, PANT KJ, THOMAS FO, AND PRICE PJ: Chemical-viral co-carcinogenesis: Requirement for leukemia virus expression for accelerated transformation. *Int. J. Cancer* 18:852-858, 1976.

KOURI RE, KURTZ SA, PRICE PJ, AND BENEDICT WF: 1-B-D-Arabinofurano sylcytosine induced malignant transformation of hamster and rat cells in culture. *Cancer Res.* 35:2413-2419, 1975.

PRICE PJ, SUK WA, SKEEN PC, CHIRIGOS MA, AND HUEBNER RJ: Transforming potential of the anticancer drug adriamycin. *Science* 187:1200-1201, 1975.

FREEMAN AE, IGEL HJ, AND PRICE PJ: Carcinogenesis in vitro. I. In Vitro transformation of rat embryo cells: Correlation with the known tumorigenic activities of chemicals in rodents. *In Vitro* II:107-116, 1975.

PRICE PJ, SUK WA, PETERS RL, MARTIN CE, BELLEW TM, AND HUEBNER RJ: Cordycepin inhibition of 3-methylcholanthrene induced transformation in vitro. *Proc. Soc. Exp. Biol. Med.* 150:650-653, 1975.

PRICE PJ, ARNSTEIN P, SUK WA, VERNON ML, AND HUEBNER RJ: Brief communication: Type "C" RNA viruses of the NIH "nude" mouse. *J. Nat. Cancer Inst.* 55:1231-1232, 1975.

PRICE PJ, SUK WA, SPAHN GJ, CHIRIGOS MA, LANE JA, AND HUEBNER RJ: Streptonigrin inhibition of 3-methylcholanthrene transformation in vitro. *Proc. Soc. Exp. Biol. Med.* 145:1197-1200, 1974.

SARMA PS, SHARAR A, TSENG F, PRICE PJ, AND GARDNER MB: Studies on the prevalence of endogenous type-C virus RD114 in cats. *Proc. Soc. Exp. Biol. Med.* 145:757-762, 1974.

ARNSTEIN P, LEVY JA, OSHIRO LS, PRICE PJ, SUK WA AND LENNETTE EH: Recovery of murine xenotropic type C virus from C57/Leaden mice. *J. Nat. Cancer Inst.* 53:1787-1792, 1974.

FREEMAN AE, PRICE PJ, ZIMMERMAN EM, KELLOFF GJ, AND HUEBNER RJ: RNA tumor virus genomes as determinants of chemically-induced transformation in vitro. *Bibl. Haemat.* 39:617-634, 1973.

PRICE PJ, SUK WA, ZIMMERMAN EM, SPAHN GJ, GAZDAR AF, AND BARON S: Enhancement of in vitro transformation of polyinosinic - polycytidylic acid. *J. Nat. Cancer Inst.* 50:1299-1305, 1973.

PRICE PJ AND CSEREPFALVI M: Pulp viability and homotransplantation of frozen teeth. *J. Dent. Res.* 51:39-43, 1972.

PRICE PJ, SUK WA, SPAHN GJ, AND FREEMAN AE: Transformation of Fisher rat embryo cells by the combined action of murine leukemia virus and (-)-trans-delta 9-tetrahydrocannabinol. *Proc. Soc. Exp. Biol. Med.* 140:454-456, 1972.

PRICE PJ, SUK WA, AND FREEMAN AE: Type C RNA tumor viruses as determinants of chemical carcinogenesis. I. Effects of Sequences of Treatment. *Science* 177:1003-1004, 1972.

ZIMMERMAN EM, FREEMAN AE, PRICE PJ, HOLBROOK Z, AND UHLENDORF CP: A simple interferon assay as an adjunct for determining genus of origin of cell cultures. *In Vitro* 8:85-90, 1972.

PRICE PJ, FREEMAN AE, LANE WT AND HUEBNER RJ: Morphological transformation of rat embryo cells by the combined action of 3-methylcholanthrene and Rauscher leukemia virus. *Nature New Biology* 230:144-146, 1971.

FREEMAN AE, PRICE PJ, BRYAN PJ, GILDEN RV, GORDON PJ, KELLOFF GJ, AND HUEBNER RJ: Transformation of rat and hamster embryo cells by extracts of city smog. *Proc. Nat. Acad. Sci.* 68:445-449, 1971.

FREEMAN AE, PRICE PJ, IGEL JH, YOUNG JC, MARYAK JM, AND HUEBNER RJ: Morphological transformation of rat embryo cells induced by diethylnitrosamine and murine leukemia viruses. *J. Nat. Cancer Inst.* 44:65-78, 1970.

CSEREPFALVI M AND PRICE PJ: Transplantation of a preserved human tooth to a monkey: Preliminary report of a case. *J. Dent. Res.* 47:641-643, 1968

PRICE PJ, BRAY VF, AND FREEMAN AE: Short-term storage in dry ice of tissue culture cells previously stored in liquid nitrogen vapor. *Cryobiology* 4:237-239, 1968.

PRICE PJ, ANDERSON BP, AND BELL MR: The freezing and processing of human embryonic cells. *Cryobiology* 3:85-87, 1966

FREEMAN AE, CALISHER CH, PRICE PJ, TURNER HC, AND HUEBNER RJ: Calcium sensitivity of cell cultures derived from virus induced tumors. *Proc. Soc. Exp. Biol. Med.* 122:835-840, 1966.

FREEMAN AE, HOLLINGER S, PRICE PJ, AND CALISHER CH: Effects of calcium on cell lines derived from adenovirus type 12-induced hamster tumors. *Exp. Cell Res.* 39:259-264, 1965

SOLICITED REVIEW ARTICLES

PRICE, P.J. AND Brewer, G.J.: Serum-free media for neural cell cultures: adult and embryonic. In "Protocols for Neural Cell Culture" Vol. 3, Ed. S. Federoff, Humana Press: in press, 2000.

PRICE PJ: Hybridoma Technology. In "Advances in Cell Culture" Vol. 4. Ed. K. Maramorosch. Academic Press, 157-177, 1985.

MARCOVINA S, PRICE PJ, McDUGAL JS, AND CRESMONESI L: Monoclonal antibodies directed against human low density lipoprotein (LPL) and their characterization by the immunodot technique. In: "Protides of the Biological Fluids" Vol. 31. Eds. H. Peters, Pergamon Press: 985-988, 1984.

PRICE PJ: Hybridoma Technology. In: "Research in Clinic and Laboratory." monograph of "Plasma Proteins in Clinical Diagnosis." Vol. 14. Eds. F. Dammacco, S. Marcovina, A.D. Carbonara, A. Peracino and L. Scarponi, 277-286, 1984.

PRICE PJ AND MISHRA NK: The use of Fischer rat embryo cells as a screen for chemical carcinogens and the role of the non-transforming type "C" RNA tumor viruses in the assay. In: "Mammalian Cell Transformation by Chemical Carcinogens," monograph of "Advances in Contemporary Environmental Toxicology," 213-239, 1981.

PRICE PJ: Inhibition of chemical transformation in vitro and tumor induction in vivo by inhibition of viral expression. In: The Role of Viruses in Human Cancer, Vol 1. Eds. Gaetano Giraldo and Elke Beth. Elsievers, 157-170, 1980.

HUEBNER RJ, FISH DC, PRICE PJ, GILDEN RV, TONI R AND HILL RW: Immuno-prevention of leukemia in AKR mice by type specific immune gamma-globulin. In: Ecological Perspectives on Carcinogens and Cancer Control. Monograph of "Progress in Biochemical Pharmacology," Vol. 14, 1978.

FREEMAN AE, PRICE PJ, ZIMMERMAN EM, KELLOFF GJ, AND HUEBNER RJ: RNA tumor virus genomes as determinants of chemically induced transformation in vitro. Proc. 5th International Symposium on Comparative Leukemia Res, Padua, Venice, 1971.

HUEBNER RJ, FREEMAN AE, WHITMIRE CD, PRICE PJ, RHIM JS, KELLOFF GJ, GILDEN RN, AND MEIR H: Endogenous and exogenous RNA tumor virus genomes in chemical carcinogenesis. Monograph of the 24th Annual Symposium on Fundamental Cancer Research, "Environment and Cancer," Houston, Texas, 1971.

QUASI PEER REVIEWED ARTICLES:

PRICE PJ: A simple rapid method for freezing hybridomas. *J. Tissue Culture Methods* 9:167-169, 1985.

PRICE PJ: Preparation and use of rat-tail collagen. *Tissue Culture Association Manual* 1:43-44, 1975.

FREEMAN AE, HOLLINGER S, PRICE PJ, AND CALISHER CH: Effect of calcium on cell lines derived from adenovirus type 12-induced hamster tumors. *Federation Proceedings* 24:2, 1965.

MEETING PRESENTATION:

PRICE PJ AND LOBO-ALFONSO J: "Hepatozyme SFM, A Serum-Free Medium for the Retention of Xenobiotic-Inducible Cytochrome P450 Gene Expression". Annual Meetings of the Swiss Tissue Culture Association, Lausanne, Switzerland, 1996.

PRICE PJ and BREWER GJ: "Culture of Adult Neurons and Their Age-Dependent Glutamate and Lactate Toxicity". 25th Annual Meeting, Society for Neuroscience, San Diego, CA, 1995.

PRICE PJ AND BREWER GJ: "Serum-Free B27/Neurobasal Medium Supports Differentiated Growth of Neurons from Striatum Substantia Nigra Septum, Cerebral Cortex, Cerbellum and Dentate Gyrus". 24th Annual Meeting, Society for Neuroscience, Miami Beach, Florida, 1994.

JAYME, DW, FIKE, RM, KUBIAK, JM AND PRICE, PJ: "Stable Liquid Concentrates Improve Nutrient Medium Performance". TCA Annual Meeting, San Diego, California, 1993.

JAYME D, PRICE P, FIKE R, KUBIAK J, NASH C, AND DISORBO D: "Use of Liquid Medium Concentrates to Enhance Biological Productivity," Jap. Assoc. Animal Cell Tech. (JAACT), Omiya, Japan, 1992.

FIKE R, KUBIAK J, PRICE P, JAYME D: "Use of a Balanced Nutrient Supplement delivered by Computer-Controlled Continual Addition to Boost Monoclonal Antibody Yields in Hybridoma Culture," IBEX '92, San Francisco, CA, 1992.

JAYME D, DISORBO D, KUBIAK J, FIKE R, AND PRICE P: "Enhanced Biological Productivity through the use of Liquid Medium Concentrates," IBEX '92, San Francisco, CA, 1992.

BREWER GJ, TORRICELLI JR, AND PRICE P: Optimized survival of hippocampal neurons in B27, a new defined serum-free medium. 22nd Annual Meeting of the Society for Neuroscience, Annneheim, CA, 1992.

PRICE PJ, SAMROCK RL AND LOBO JO: Long-term maintenance and induction of cytochrome P450 in rat hepatocytes in vitro. Annual meeting of the Environmental Mutagen Society, Reno NV, 1992.

PRICE PJ, BRANDENSTEIN MC, WEBSTER L, FARSON DA, FAULCONER KJ, AND VOSS HF: A serum-free medium for the growth and scale-up of attached and/or non-attached CHO cells. Poster, Soc. Industrial Microbiol., Baltimore, MD, 1987.

PRICE PJ: Hybridoma Technology: keynote address to the International Symposium on Clinical Chemistry, Naples, Italy, 1983.

PRICE PJ: Hybridoma Technology: annual meeting of the Pharmaceutical Manufacturers Association, Palm Beach, FL, 1983.

PRICE PJ: Association between chemically induced transformation and type-C RNA virus expression. Presentation given at the 10th Joint Working Conference of the Virus Cancer Program, Hershey, PA, 1975.

PRICE PJ: Oncogenes of RNA tumor viruses as determinants of cancer. Lecture to the American Cancer Society Seminar, 1973.

PRICE PJ AND CSEREPFALVI M: Homo and hetrotransplantation of human and monkey teeth. Paper presented at the 2nd International Conference of Transplant and Implant, Caracas, Venezuela, 1968.

PRICE PJ, COSTELNIC M, AND BELL MR: Attachment and proliferation of cortisone acetate and insulin treated primary human amnion cells. Paper presented at the 1966 meeting of the Tissue Culture Association, San Francisco, CA.

PRICE PJ: The effects of sublethal doses of X-irradiation on mammalian cells in vitro. Paper presented at the 1964 meeting of the Tissue Culture Association, Baltimore, MD.

EXTERNAL SCIENTIFIC RECOGNITION:

Outside Review Panels:

NIH (NCI) extramural contract review panel, 1984.

Consultantships:

Pan American Health Organization (PAHO), 1979-1983.

Instituto Behring, Italy, 1980-1983.

Hybritech Corp., La Jolla, CA, 1978.

Scientific Boards and Committees:

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| 1993 - 1995 | Board of Directors - National Institute for the Advancement of In Vitro Sciences. |
| 1995 - 1998 | Scientific Advisory Committee, The Cosmetic, Toiletry and Frangrance Association. |
| 1995 - 1998 | Alternative Testing Task Force, The Cosmetic, Toiletry and Frangrance Association. |
| 1996 - 1998 | Scientific Advisory Board, Society for In Vitro Biology |

RECOGNITION OF SCIENTIFIC MERIT:

Funded Grant/Contract Applications:

1984-1985 Senior Scientist, SBIR Grant
To develop monoclonal antibodies to apolipoproteins A1 and B to be used as a diagnostic for the probability of heart disease.

1984-1985 Project Director, SBIR Grant
NCI-1-R-43-CA-38458-01
To develop a cell culture medium for the selective growth of carcinoma cells with emphasis on prostate carcinoma

1984 - 1985 Project Director, SBIR Grant
NCI-1-R-43-CA-36658-0141
To develop and characterize a HPRT⁻ Hat Sensitive mutant from a myeloma cell line of human origin.

1976 - 1978 Project Director: NO1-CP-43240
Initiate projects to develop and characterize in vitro cell systems to study the interactions of "C" type RNA viruses with chemical carcinogens.

NO1-CP-61045 entitled, "Development of mammalian cell lines, known to contain endogenous virus sequences which can be utilized in testing mutagenic and carcinogenic effects of environmental factors."

1975 - 1976 Project Co-Director, Environmental Protection Agency Contract: 68-02-2271, entitled "In Vitro Screening of Selected Air Pollutants for Potential Carcinogenicity."

Consultant, National Cancer Institute
(NCI) contract: NO1-CP-55670-57 entitled, "Development of Detailed Methods and Protocols for Carcinogenesis Screening Using Cell Culture Assays."

1973 - 1976 Project Director
National Heart Institute Contract: NO1-NH-92245 entitled, "Studies on the Biochemistry and Neural Coding of Brain Cells."

1974 - 1977 Project Co-Director, NCI Contract
NO1-CP-53519B entitled,
"Isolation and Characterization of Type-C Viruses"

1968 - 1974 Project Co-Director, NCI Contracts: PH-43-68-706:
NIH-NCI-E-2068B

1970 - 1972 Project Co-Director
Council for Tobacco Research
Contract: 2220A

To develop in vitro transformation systems to assay quantitatively the carcinogenic potential of various chemical and environmental contaminants and to study possible activation of viral oncogens.

Internal Recognition:

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| 1999 | Coffin Award for Scientific Innovation, Life Technologies, Inc. |
| 1996 | Coffin Award for Scientific Innovation, Life Technologies, Inc. |
| 1994 | Outstanding Citizenship Award, Life Technologies, Inc. |
| 1989 | Received an "Outstanding Performance" bonus, Hana Biologics, Alameda, CA. |
| 1979 - 1983 | While Chief of the Cell Culture and Media Branch and Central Hybridoma Laboratories, Centers for Disease Control (CDC), the entire Branch received the "Outstanding Performance" award for three out of five years. |

TECHNOLOGY DEVELOPMENT:

Products Developed:

1994 - 2002 New Iron-Enriched Donor Calf, Neurobasal, Neurobasal-A,B27 Supplement, Modified DMEM and DMEM: F12, Hepatozyme SFM, Hepatocyte Wash Medium, Liver Transport Medium, Liver Perfusion Medium, Liver Digest Medium, HB-CHO, CD-CHO, OptiMem I, Turbo Calf, Hybridoma Media Supplement, Knockout SR, Hibernate-A, Hibernate-E, VP-SFM, Mod. MEM for Virus Production, OptiPRO SFM, EMEM-RSM, DMEM-RSM, RPMI1640-RSM, non-animal trypsin substitute.

Patents (Received):

Improved cell cryopreservation method, WO92/03046

Animal cell culture media comprising peptides derived from rice, U.S. Patent 6,103,529

Culture medium for maintaining neural cells in ambient atmosphere, U.S. patent 6,180,404

Patents (Applications):

Proliferated Hepatocytes and process

Animal Cell Culture Media Comprising Plant-derived Nutrients

Embryonic Stem Cell Serum Replacement

Hibernation Medium for Brain Tissue

Products Improved or Redeveloped:

Mycotrim GU (Hana Biologics, Irvine Scientific)

Amniostat (Hana Biologics, Irvine Scientific)

DMEM

DMEM: F12

Iron-Enriched Donor Calf Serum

APPENDIX I

EDUCATION:

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| 1963, Ph.D. Thesis: | Cytology, The George Washington University, Wash. DC The effects of sublethal doses of X-irradiation on mammalian cells in vitro. |
| 1961, M.S. | Cytology, The George Washington University, Wash. DC |

Thesis: The use of antibiotics in the treatment of tissue culture cells contaminated with bacterial L-forms or PPLO.

1959, B.S. Microbiology, University of Maryland, College Park MD

EXPERIENCE:

1992-Present Research Fellow
GIBCO BRL/Life Technologies, Inc.
Grand Island, NY 14072

1990-1992 Principal Scientist
GIBCO BRL/Life Technologies, Inc.
Grand Island, NY 14072

1986-1990 Staff Scientist
Director, Cell Biology and Diagnostics
Director, Hemophilia Project
Hana Biologics, Inc.
Alameda, CA 94501

1985-1986 Director, Biologics Production and Scientific Director
Hazelton Research Products, inc.
Denver, PA 17517

1983-1985 Executive Vice President
Hybridoma Sciences, Inc.
Atlanta, GA 30333

1978-1983 Chief, Cell Culture and Media Branch
Co-Director, Hybridoma Laboratory
Centers for Disease Control
Atlanta, GA 30333

1976-1978 Associate Director of Research
Torrey Pines Research Center
La Jolla, CA 90319

1959-1976 Microbiological Association, Inc.
Bethesda, MD 20014

1965-1968 Director of Cell Production
Microbiological Associates
Bethesda, MD

1964-1965 Director, Quality Control Department
Microbiological Associates

1961-1964 Cell Physiologist
Department of Virus Research
Microbiological Associates

1959-1961 Chief, Tissue Culture Department
Microbiological Associates

1957-1958

Histologist's Assistant
Maryland State Livestock Laboratories

APPENDIX II

Scientific Society Memberships:

Society for In Vitro Biology
American Association for the Advancement of Science
Tissue Culture Association
Society of Cryobiology (Charter Member)
The American Society for Cell Biology
American Society for Microbiology
American Association for Cancer Research
Society for Experimental Biology and Medicine
The New York Academy of Sciences
National Capitol Area Branch of the TCA (Charter Member)
TCA California Branch
International Association for Comparative Research on Leukemia and Related Diseases
Sigma Xi - National Scientific Honorary
Sigma Alpha Omicron - National Microbiology Honorary
National Committee for Clinical Laboratory Standards
Society for Industrial Microbiology
Society for Neuroscience
Environmental Mutagen Society
Society for Toxicology

Adjunct Teaching Positions:

Adjunct Professor, Department of Applied Biology
Georgia Institute of Technology
Atlanta, GA 30333

1966 - 1974 Professorial Lecturer
 Department of Microbiology
 School of Medicine
 The George Washington University
 Washington, DC 20005

Elected Officer of Professional Society:

Soc. for In Vitro Biology – Public Policy Chair, 2002-2004

Soc. for In Vitro Biology - Vice-President, 1998-2000

Tissue Culture Association - Co Chair, In Vitro Toxicology Committee, 1992-1995

Society Industrial Microbiology - Northern California Society,

Organization Committee, 1988-1989
Membership Chair and Board of Directors, 1989-1990

Tissue Culture Association - California Branch, Annual Meeting Chair,
1989-1990

Tissue Culture Association - National Capitol Area Branch, Vice
President, 1975-1976

Tissue Culture Association - Membership Committee, 1971-1975

Journal Reviewer:

J. Tissue Culture Methods, 1983-Present
In Vitro, 1977-1978

Professional Activity in Toxicology:

Environmental Mutagen Society, 1991-Present
Society for Toxicology, 1991-Present
Toxicology Group, Tissue Culture Association, 1989-Present
Industrial In Vitro Toxicology Group, 1988-Present

Management and Other Courses:

Quest: 1994
Good Manufacturing Practices (GMP) : 1989
Supervision I, II and III : 1979-81
Zenger-Miller : 1986-88, 1992-94
One Minute Manager : 1985
Self-Esteem : 1992

Internal Committees:

Career Ladder QIT
Trypsin QIT
Liquid Media Concentrate Product Improvement Team
Liquid Media Concentrate Process Team
Liquid Media Concentrate Steering Committee
TQM Moderator
Corrective Action Committee
Serum Business Team
Reagents Business Team
Liquid Media Business Team